

- Claims 1-35 were rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of U.S. Patent Number 5,083,361 to Rudy, U.S. Patent Number 4,025,974 to Lea, et al., and U.S. Patent Number 5,993,585 to Goodwin, et al.

II. Summary of Claims

Claims 1-35 are currently pending in the application, with claims 1, 17, and 31 being independent claims. No claims are cancelled, added, or amended. Accordingly, claims 1-35 remain in their original, as-filed condition.

III. Discussion of §112 Rejections

Applicant has reviewed claims 14, 15, and 28 and respectfully submits that these claims are not indefinite. Independent claim 1 recites a method of forming a bladder that includes steps of placing, heating, and bonding. More particularly, claim 1 recites the step of "placing at least one core between a first sheet and a second sheet of thermoplastic material, said at least one core having a first outer layer and a second outer layer, said outer layers being spaced apart and connected together by a plurality of connecting members...." Claims 14 and 15 each recite "The method of claim 1, wherein the step of placing said at least one core between said first sheet and said second sheet includes...." This portion of each of claims 14 and 15 refer, therefore, to the placing step in claim 1. A similar analysis applies to claim 28, which depends from independent claim 17. Applicants have, therefore, reviewed the rejected claims and cannot discern the manner in which the claims are indefinite. Clarification or withdrawal of the rejection is, therefore, respectfully requested.

IV. Discussion of Prior Art

U.S. Patent Number 5,083,361 to Rudy (hereafter referred to as Rudy) discloses a fluid-filled bladder having an outer barrier layer envelope formed from a pair of elastomeric sheets. The envelope forms a sealed, pressurized chamber that encompasses a core with a pair of fabric layers connected by a plurality of drop threads. The core is secured to the elastomeric sheets. More specifically, the each fabric layer is bonded to one of the elastomeric sheets such that the drop threads are placed in tension to restrain outward movement of the elastomeric sheets.

U.S. Patent Number 5,993,585 to Goodwin, et al. (hereafter referred to as Goodwin) discloses a method of forming a fluid-filled bladder. Initially, a first sheet is preformed with a thermoforming apparatus to form sidewalls and a lower surface of the bladder (see Figure 6A), thereby forming a concave area. The first sheet is removed from the thermoforming apparatus and placed within a laminating apparatus. In addition, a double-walled fabric core is placed within the concave area and a second sheet is placed over the core. The laminating apparatus then compresses and heats the first sheet, second sheet, and core, thereby bonding the outer layers of the core to the first and second sheets (see Figures 8A-8C). A sealing die is then utilized to bond the first sheet and second sheet around the periphery of the core to seal the bladder (see Figures 9A-9C). Finally, the bladder may be inflated, thereby placing connecting members of the core in tension. Accordingly, the method involves a plurality of discrete steps that form the sidewalls, bond the core to the sheets, and form the peripheral bond.

U.S. Patent Number 4,025,974 to Lea, et al. (hereafter referred to as Lea) discloses an air mattress and a method of manufacturing the mattress. The method involves securing a first sheet of polymer material within a frame (see Figures 8-11). A foam member is placed on top of the first sheet (see Figures 12 and 13) and a second sheet that is also secured within a frame is placed above the foam member (see Figures 14 and 15). Accordingly, the foam member is sandwiched between the first and second sheets. A pair of hot press platens then contact the first and second sheets, thereby heating and bonding the first and second sheets to the foam material (see Figures 17 and 18). In addition, peripheral portions of the sheets are bonded with the platens. Air is then evacuated from the interior of the first and second sheets to compress the first and second sheets against the foam material (see Figure 19) and bond the sheets to opposite sides of the foam material. Finally, the mattress may be pressurized through a valve.

V. The Claims Patentably Distinguish Over The Applied Prior Art

Claims 1-35 were rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Rudy, Goodwin, and Lea. Independent claim 1 recites a method of forming a bladder that includes steps of placing, heating, and bonding. In the placing step, at least one core is located between a first sheet and a second sheet of thermoplastic material. The core has a first outer layer and a second outer layer that are spaced apart and connected together by a plurality of connecting members. The first sheet, second sheet, and core are then heated in the heating step.

In the bonding step, the first sheet is bonded to the first outer layer, the second sheet is bonded to the second outer layer, and the first sheet and the second sheet are bonded together around a periphery of the core by compressing the first sheet, the second sheet, and the core in a mold. The mold operates to shape the bladder and bond the components. For example, a first portion of the mold contacts the first sheet adjacent to the first outer layer to bond the first sheet to the first outer layer and form a sidewall around the periphery of the core. A second portion of the mold contacts the second sheet adjacent to the second outer layer, thereby bonding the second sheet to the second outer layer. Furthermore, the first sheet and the second sheet are compressed together around the periphery of the core to form a peripheral bond between the second sheet and the sidewall of the first sheet.

The above discussion of independent claim 1 illustrates that the method involves a single mold that performs a variety of functions. For example, the mold bonds the sheets to the core, the mold forms the sidewall, and the mold forms the peripheral bond. The mold, therefore, shapes the bladder and bonds the components of the bladder together. One skilled in the art will recognize that the term "mold" is defined as a cavity in which a substance is shaped (Merriam-Webster's Collegiate Dictionary, Tenth Edition, 2000). Of the references cited in the rejection, only Goodwin discloses a mold. In Goodwin, the mold forms the sidewalls, and the various bonding steps are performed by a lamination apparatus and a sealing die. In contrast Rudy does not disclose specifics of making the bladder and does not suggest the use of a single mold. Furthermore, Lea merely discloses frames that hold the components and platens that heat and bond the components. In consideration of the fact that only Goodwin discloses a mold, and the mold is merely utilized for shaping the sidewall, the combination of Rudy, Goodwin, and Lea does not teach or suggest a single mold that bonds the sheets to the core, forms the sidewall, and forms the peripheral bond.

The method of manufacturing the bladder recited in claim 1 enumerates specific functions for the mold and the various components of the mold. For example, the first portion of the mold contacts the first sheet and bonds the first sheet to the first outer layer. The first portion of the mold also forms the sidewall. The second portion of the mold contacts the second sheet and bonds the second sheet to the second outer layer. Furthermore, the mold forms the peripheral bond. The rejection utilizes various references to purportedly demonstrate that the method is obvious in light of the references. The rejection, however, does not demonstrate the